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PROFILE

November 1976

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Published during the school year by High School News Service, a Department of Defense activity located at Norfolk, VA. Distribution is free directly to high schools and junior high schools, colleges and universities, libraries, career centers and ROTC units requesting the service.

PROFILE's purpose is to inform young people and guidance personnel on benefits, opportunities, privileges and programs of military service. As a public service vehicle, it provides information to the American people about their military forces.

The Secretary of the Navy has determined that publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication was approved by the Office of Management and Budget, 8 August 1975.

Cover:

A Navy P-3 shown on patrol. The sub hunters are featured beginning on page 12. (Official Navy photo)

PROFILE

November 1976 Vol. 20 No. 2

AMVER: "No Call for Help Shall go Unanswered" 3
The A-G-E of the Air Force 6
Soldiers of the Sea 9
Hunting with the "Eagles" (Two part story) 12
Engineers: The Army's Builders 20

Counselor's Corner

* Soon after receipt of this magazine, you will be receiving an annual survey card. To insure that your address is correct, that the proper number of publications reach you monthly and that you remain on our mailing list, please complete and return this card promptly.

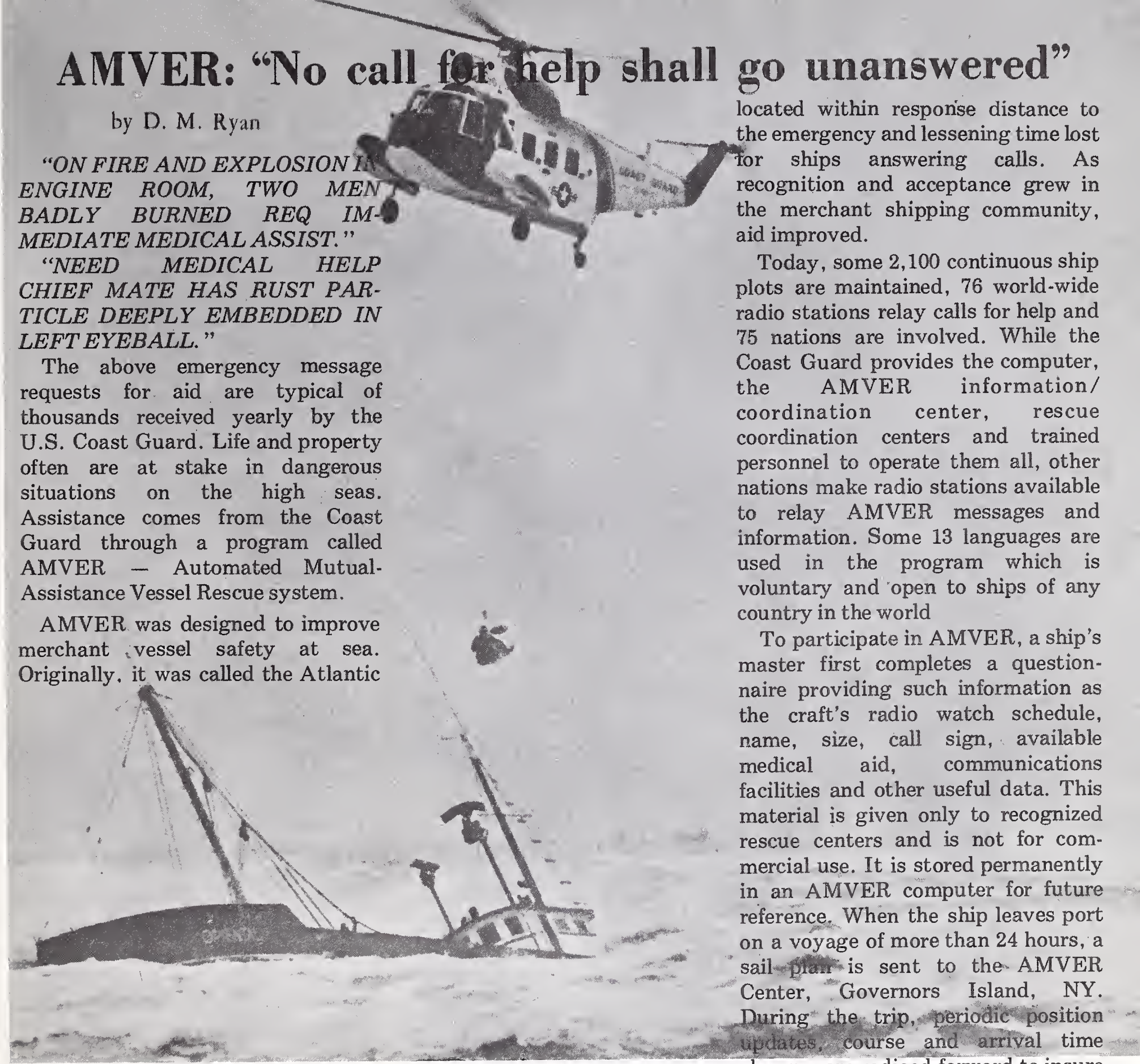
* HSNS is not staffed to provide detailed information on job skills, careers, military history or other topics of that type. The October **PROFILE**, page 2, has a listing of addressees by service where additional material and answers to questions may be obtained. Please use those addresses. Do write to HSNS if you have queries concerning magazine circulation, comments or suggestions.

* A reminder: men and women interested in applying for one of the Federal Service Academies should begin writing their Congressional representatives and the Academies during the spring of junior year in high school. This will insure that an admissions file is started and that catalogs are received. Those interested in the Coast Guard Academy should write directly to the Director of Admissions at the school.

* There are several other sources available to counselors which cover specific programs in today's American Forces open to young men and women. Three of them are: **DoD Occupational Source Book "Occupations"** — describes military jobs and cross-references them to the Department of Labor's DOT codes — it is available from Commander, Armed Forces Vocational Testing Group, Universal City, TX 78148; **American Series VIEW** (Vital Information for Education and Work) — describes civilian occupations and military counterparts — available in microfilm form in states participating in the VIEW program, hard copies available from military recruiters; **Counselor Films, Inc. Film Service on Careers** — describes civilian careers with cross-reference to similar military occupations — distributed to State Directors of Vocational Education.

AMVER: "No call for help shall go unanswered"

by D. M. Ryan



"ON FIRE AND EXPLOSION IN ENGINE ROOM, TWO MEN BADLY BURNED REQ IMMEDIATE MEDICAL ASSIST."

"NEED MEDICAL HELP CHIEF MATE HAS RUST PARTICLE DEEPLY EMBEDDED IN LEFT EYEBALL."

The above emergency message requests for aid are typical of thousands received yearly by the U.S. Coast Guard. Life and property often are at stake in dangerous situations on the high seas. Assistance comes from the Coast Guard through a program called AMVER — Automated Mutual-Assistance Vessel Rescue system.

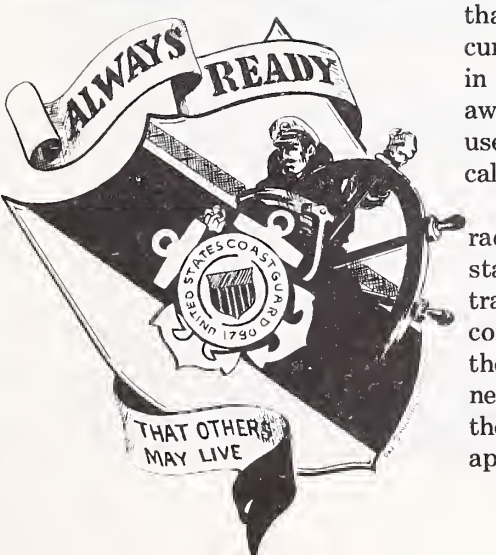
AMVER was designed to improve merchant vessel safety at sea. Originally, it was called the Atlantic Merchant Vessel Report system and used hand-calculated plots of ships within the CG's Atlantic search and rescue area. The goal was to keep track of ship positions so that if an emergency arose at sea, the nearest help could be pinpointed quickly and dispatched to the scene.

In 1958, AMVER became computerized and added data processing equipment, thus increasing its scope of assistance. Benefits of the new system included improving the likelihood of rapid aid, reducing the calls for assistance to ships not located within response distance to the emergency and lessening time lost for ships answering calls. As recognition and acceptance grew in the merchant shipping community, aid improved.

Today, some 2,100 continuous ship plots are maintained, 76 world-wide radio stations relay calls for help and 75 nations are involved. While the Coast Guard provides the computer, the AMVER information/coordination center, rescue coordination centers and trained personnel to operate them all, other nations make radio stations available to relay AMVER messages and information. Some 13 languages are used in the program which is voluntary and open to ships of any country in the world

To participate in AMVER, a ship's master first completes a questionnaire providing such information as the craft's radio watch schedule, name, size, call sign, available medical aid, communications facilities and other useful data. This material is given only to recognized rescue centers and is not for commercial use. It is stored permanently in an AMVER computer for future reference. When the ship leaves port on a voyage of more than 24 hours, a sail plan is sent to the AMVER Center, Governors Island, NY. During the trip, periodic position updates, course and arrival time changes are radioed forward to insure that information in the Center is current and correct. All data remains in the computer and is updated awaiting the time it might have to be used in connection with a distress call.

If an emergency occurs, the ship radios a call for help to an AMVER station. From there the signal is transmitted to NY and quickly the computer provides a list of vessels in the area which meet the emergency needs. Necessary data is forwarded to the requesting rescue center and appropriate ships notified of the

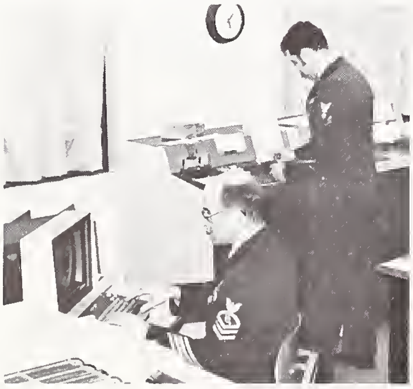


problem and location where help is needed. In addition, CG Rescue Coordination Centers take actions to dispatch their available aircraft and/or ships to the scene.

While the computer is important to the AMVER operation, the Coast Guardsmen are also key. At the NY Center, 30 people work and stand watches in shifts around the clock to monitor the operation by checking completeness and accuracy of messages received and keypunching the information into a computer card. Through a user's terminal, the information is sent to the computer, compared with existing data and differences noted for examination. Inaccuracies are checked by the watch personnel and final correct data replaces old information. This operation occurs thousands of times each month, with an average of 800 ships a day being tracked.

Watchstander uses records and charts to check incoming messages for errors before having them translated to numerical language for use by the AMVER computer. (U. S. Coast Guard Photo)

Upon receiving a call for assistance, the watch personnel verify it, translate it into computer language and receive back a surface position list through a teletype circuit. The print-out can be sent to recognized rescue centers around the world. It notes ships in the emergency area and their positions, call signs, aid available and other data needed in the rescue effort. If only ships going east with medical persons aboard are needed and requested, that is all the computer will list. The appropriate ship(s) are notified and aid speeds to the scene. This system can be used to assist in ship disasters, medical emergencies, overdue craft incidents, ditched aircraft occurrances and search planning.



Above, one watchstander keypunches coded message traffic onto data cards while another verifies and checks each card for errors. Left, message information is entered into the computer using the data cards and a card reader (watchstander in rear). A console, foreground, is used to communicate with the computer and let it know that data is being sent. (U. S. Coast Guard Photos).

Members of an AMVER watch crew are usually from one of several career fields such as aviation machinist mate, yeoman, radioman, radarman, quartermaster and boatswain's mate. In most cases, they attend a local civilian computer school after selection for this duty.

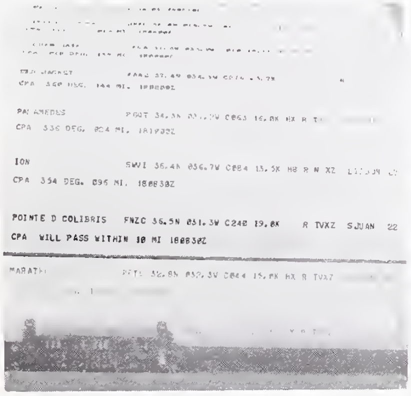
Training is in the areas of programming, analysis and keypunching. This along with prior CG schooling and experiences, makes the AMVER watch person well qualified to perform the ever important life-saving mission.

In addition to the NY Center personnel, numerous other Coast Guardsmen are involved to different degrees in the AMVER program. Rescue Coordination Centers receive, relay and transmit calls for assistance as well as coordinate CG and civilian aircraft and ships in rescue missions. CG rescue craft are ever alert to respond to disaster calls with air and sea aid in the form of medical personnel, towing, firefighting equipment, evacuation gear and water pumps. Often, they work with merchant ships in the area to coordinate rescue or aid.

The future of AMVER depends greatly on the numbers of ships participating and the improvement in communications. With more participation, chances for fast, effective assistance increases. Advanced communications, telex terminals on ships, satellite communications and more shore communications facilities can help insure future success in providing marine safety. These advances will also require more highly trained and technically competent Coast Guardsmen.

Aiding fellow mariners in distress is a timeless tradition of the sea. In the vast expanses of ocean, life and death often hinge on the chance that help is nearby and can be summoned in an emergency. With the AMVER program, the chance factor is reduced more to fact. International cooperation and entrance into the computer age have made AMVER an invaluable method of safeguarding the merchant community. Merchantmen the world over can depend on the fact that should disaster or trouble strike at sea, the U.S. Coast Guard is ready to insure "that no call for help shall go unanswered."

The Rescue Coordination Center, Boston, MA, receives distress calls and relays them to the AMVER Center. (Photo by D. M. Ryan) Below, a watchstander initiates a request for data from the computer and in 5-20 minutes receives back a list of vessels, below left, traveling in the distress area. (U. S. Coast Guard Photos)



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Left, a CG duty officer at Otis Air Station, MA, receives notification of the situation and dispatches an aircraft (Photo by D. M. Ryan) At the scene, below, the aircraft circles, standing-by to assist if needed, while an AMVER-participating ship, left, maneuvers in to provide aid. (U. S. Coast Guard Photos)

USING A-G-E, maintenance technicians prepare the "Streak Eagle" for the chase after a world altitude record (above left). A unit to provide conditioned air for testing avionics subsystems is connected to an F-15 undergoing maintenance in an Air Force hangar (below left).

(Streak Eagle photo by SSgt H. J. Kokojan)

The A-G-E of the Air Force

by D. G. Francis

It was a crisp, Saturday morning in early January 1975. The location was Grand Forks Air Force Base, ND. A small crowd had gathered near the south end of the runway to watch. There, a concrete post had been sunk into the ground and by means of a heavy chain, an F-15 "Eagle" aircraft was hooked to it. The plane was shuddering and straining to break free as its engines peaked to full power.

This was part of the final test cycle in the Air Force's project "Streak Eagle." The F-15, during the previous few days, had already exceeded six of the seven goals that had been set for it. Now, the aircraft was only moments away from going after the world 30,000 meter time-to-climb record held by a Soviet jet — more than 18 and a half miles up in 243.3 seconds.

"Thirty thousand meters," yelled a ground controller as the "Eagle" hit altitude. Time elapsed was 207.6 seconds — a record. Thus the aircraft had made a clean sweep of existing world records for time-to-climb.

The F-15 had undergone one of its most strenuous tests as had every operational American aircraft designed before it. While the congratulations were passed around between most of the test team, a tractor driver quietly nudged a heavy piece of support equipment up beside the airplane. He would be one of the last team members involved in the project. This individual belonged to a little known, yet very vital Air Force career field — the aerospace ground equipment (A-G-E) specialist.

The basic A-G-E responsibility is to provide the equipment necessary to simulate an on-the-ground environment in which to test any aircraft system as if it were in flight. Involved are such items as motors, engine driven generators, air compressors, hydraulic test stands, air conditioners, heaters and gas turbine engines. With this equipment, Air Force maintenance experts can test all aspects of a plane from its electrical, hydraulic and fuel systems to the conditioned and compressed air, insuring the proper functioning of cabin pressure, engines, control surfaces (flaps) and landing gear. It might be noted that in most cases, a pilot can't even start his engines without an A-G-E power unit.

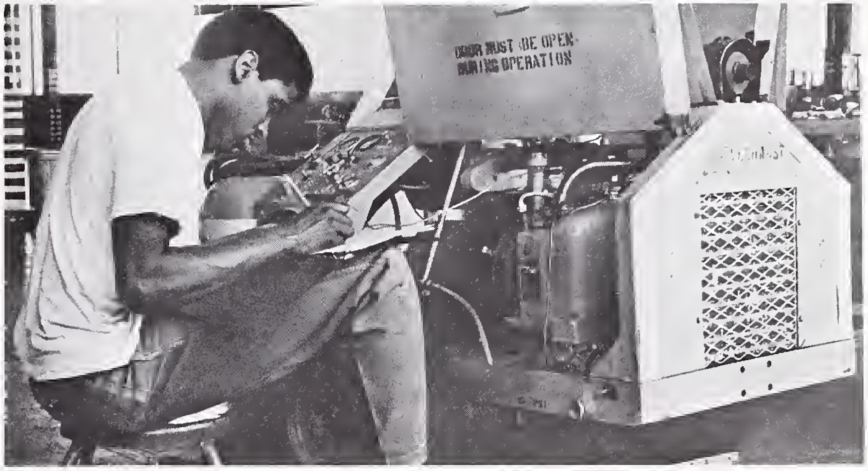
However, providing this test equipment is not the only mission of the A-G-E specialists. They must inspect, troubleshoot, overhaul, fix and even modify A-G-E. That calls for the ability to diagnose malfunctions, operate test equipment, disassemble and assemble all gear, clean, replace parts and provide general servicing.

In the field of modification, these highly trained individuals not only provide expertise, but often save taxpayers money. For example, a particular piece of equipment is originally designed to support a specific aircraft. With a few changes and adjustments, that same item can be used to test a new aircraft, thus eliminating the need for another piece of equipment. This was done in the F-15 "Eagle" program. Thanks to modification by A-G-E technicians, existing rigs were made more effective and efficient.

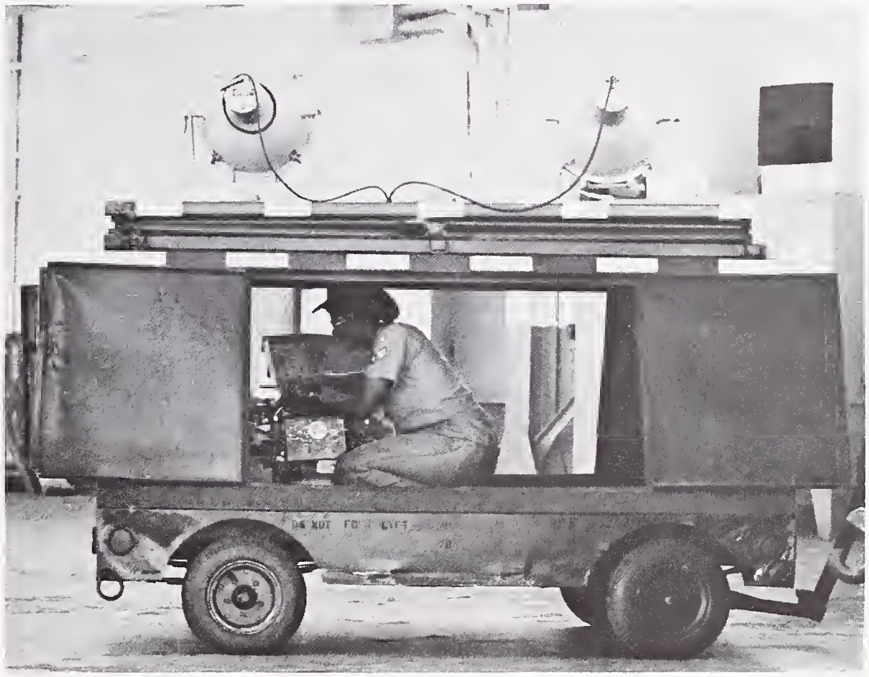
Again, all of this repair, servicing and modifying is done with the purpose of having available, equipment that can test all aircraft systems on the ground but under flight conditions. The importance of this is explained by one maintenance chief at Langley Air Force Base, VA. "Say a pilot is cruising at 22,000 feet and his instruments indicate a pressure leak in a hydraulic system or even in the cockpit. After the aircraft lands, we can't take it back up for a check. That's when we call the A-G-E section to send us the equipment to check out the pressure problem on the ground."

"Take an indicated cabin leak for instance," the chief continued. "A-G-E will send us the equipment needed to simulate any altitude and weather condition so that we can find the problem and fix it before another flight. The test equipment will even tell us if the trouble is only with a malfunctioning instrument." It must be remembered that the aircraft maintenance staff just operate the equipment, they don't repair it. Only the A-G-E specialist can keep it servicable.

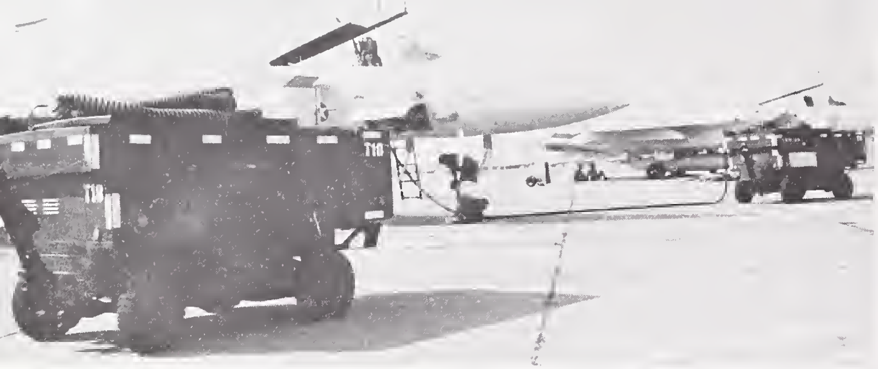
Men and women who find their way into the ground support career field, usually follow basic military training with advanced schooling at the Chanute Technical Training Center, IL, for 15 weeks. There they learn about the types of equipment to be found in A-G-E and how to maintain it. The course includes instruction in electricity, electronics, heating, refrigeration, pneumatics,


DOOR MUST BE OPEN DURING OPERATION

GROUP AND INDIVIDUAL training is continuous among A-G-E technicians.

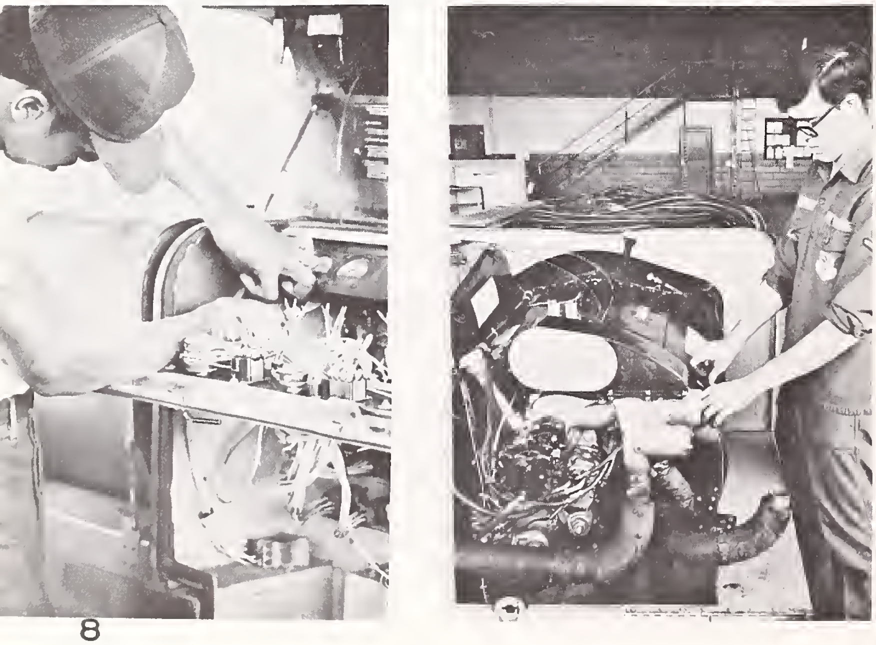


EACH TIME a piece of A-G-E, like the mobile lighting unit above, is returned to the shop after use, a technician immediately checks it inside-out to insure that it's operational when next required. Below, cleaning and servicing their equipment is a daily task for Air Force A-G-E technicians.



A HIGH VOLTAGE power unit, in front of aircraft, is used by maintenance technicians to operate components during a ground test, while a conditioned air unit stands ready for use in the foreground.

A-G-E TECHNICIANS can find themselves in awkward positions while maintaining their equipment as the one above finds out while working on a lifting device (usually used for bomb loading). Below left, a specialist works on the electrical system of a piece of A-G-E, while, below right, one performs maintenance on a unit's engine.



hydraulics, internal combustion engines and gas turbines. Students are shown how to use technical publications, blueprints, diagrams and perform proper maintenance procedures. The classroom studies are coupled with practical experience which will be utilized at various Air Force assignments worldwide.

While not prerequisites for the A-G-E field, most repair personnel have had prior school work in shop math, algebra, auto mechanics, physics and/or machine shop. Some have had experience in auto mechanics or in other repair work. This all helps the would-be A-G-E specialist score higher on the battery of tests in basic training used to determine an individual's aptitude for specific career fields.

As with projects like "Streak Eagle," aircraft must be tested with a variety of ground support equipment before experimental flights are attempted. Using A-G-E, maintenance crews can simulate all conditions of flight except stress. "With the ground equipment, we can make every system and subsystem of an aircraft perform as it would during actual flight," stated a crew chief. "That eliminates the possibility of having an accident or trouble after takeoff."

Hence, the A-G-E specialists toil daily around the world to insure that their support equipment is ready to perform. Some find themselves involved in test programs on aircraft like the F-15 "Eagle," the SR-71 which broke world speed records, or the ultra modern, experimental B-1 bomber. Others operate at bases in support of aircraft already a part of the Air Force's organization. For, everyday aircraft must also be tested just as much as the experimental ones. And, as new or older models roll on to the runway, another test cycle will begin with the maintenance crew chief probably calling, "Tell A-G-E we need a power unit at 303. The pilot wants to start his engines at 0900 (9 a.m.)."

Soldiers of the Sea

by C. L. Nelson

From the shattered and burning decks of the Continental sloop ALFRED, to the steel encased flight deck of the nuclear aircraft carrier ENTERPRISE, Marines have historically been known as "Soldiers of the Sea."

Providing specially trained units aboard Navy ships is one of the oldest and proudest missions of the U. S. Marine Corps. Essentially, only the ships have changed throughout the 200-year-old tradition. The 1775 resolution of the Continental Congress which ordered the raising of two battalions of Marines contained the following requirement: *"...that no person be appointed to office or enlisted into said Battalions, but such as are good seamen, or so acquainted with maritime affairs as to be able to serve to advantage by sea."*

Once organized as an integral part of ships' crews, Marine Detachments were tasked with heading boarding parties, providing landing forces, manning cannons and serving as sharpshooters during sea battles and enforcing discipline aboard their ships. As demonstrated during operations conducted to recover the SS MAYAGUEZ, Marines continue to perform some of these original tasks to this day.

To be selected for sea duty is a distinction now, as then, for young Marines, newly graduated from recruit training. Prospective candidates for sea duty undergo comprehensive screening through interviews and thorough examination of their records and personal histories. If their attitudes and abilities indicate that they have the potential to perform the demanding duties ahead, they report to Sea School at San Diego, California.

Sea School's mission is to adapt the skills of the basic rifleman for service aboard Navy tactical ships. To do this, the school exacts many tough requirements which each prospective seagoing Marine must meet. Already lean and hard from physical training at boot camp, they are now able to apply the strength and endurance they've gained to react properly to emergency situations.

A realistic mock-up of a ship's hull, complete with ladders, hatches and passageways, introduces the students to potential shipboard disasters. The men are stationed three decks below "topside," when a smokey oil fire breaks out and they are faced with the predicament of remaining calm enough to find their way out. A recent Sea School graduate recalls, "There was no actual danger to us, but the whole thing looked so real that I found myself reacting just as if it had happened at sea somewhere on a real ship. I had to stop and think which way was the right way before I wasted time going up the nearest clear ladder leading nowhere."

More practice in "keeping your cool" comes during drown-proofing — an effortless hour and a half of training spent floating in a semi-vertical position which teaches the Marines to conserve stamina while awaiting rescue at sea.

Classes are also added on security procedures and handling of prisoners since it's up to seagoing Marines to guard weapons areas and confinement facilities.

Sea School is far from a "piece of cake." It's tough, so tough that many students are reassigned to other bases or training programs when they cannot meet the strict requirements. Those who do make it to graduation are, and should be, justifiably proud: they've met a tough challenge head on and have succeeded.

The typical Marine Detachment aboard a ship such as an aircraft carrier or cruiser usually includes 60-80 men under the leadership of two Marine officers. For the two years of their assignment to a particular ship, the Detachment serves together as a working unit, part of the ship's company, yet also separated by the nature of their specified duties.

ON THE BRIDGE–Maintaining security throughout the ship takes up a large part of a seagoing Marine's day. Shown here among Navy men on duty, a Marine corporal perfoms another service: message delivery between the bridge and the Captain.

IT LOOKS REAL — **Marines team up during Sea School to fight one of the deadliest enemies of all ships — fire. This practice exercise teaches them to handle the equipment as well as overcome their fear in emergency situations. (U. S. Navy Photo)**

Although the ship itself never sleeps, its Marines keep fairly regular hours. A typical day begins just before dawn. After breakfast and housekeeping chores, most of the men take advantage of the many shipboard education programs which can provide anything from a high school equivalency certificate to advanced degree studies. In the afternoon, they then often take the role of teachers in training Navy personnel in self-defense measures or with small arms (weaponry). The work schedule winds up with nine laps around the flight deck (about three miles) in fair weather or indoor weightlifting workouts.

Alternating schedules or shifts are kept for security duty at the ship's confinement facility or around the weapons storage area, as well as for military ceremonies which are conducted while the ship is under way.

Ask any sailor or Marine what he likes best about the seagoing life — and chances are that he'll say, "Liberty!" Whenever the ship is docked for repairs, supplies or to take on fuel, its men are allowed to spend some time ashore — to explore the port, meet new people and stretch their legs after weeks or months at sea.

Assignment to sea duty requires an extra measure from Marines, added to the already high standards required for men in this service. Those who prove they can handle it carry on a tradition held since the Marine Corps' inception — that of sharing the task of securing the open seas.

Left, Marines on "liberty" study an ancient burial tomb in Turkey. (U. S. Marine Corps Photo)

Hunting With

Chief Reilly takes flight line photos and shows exhaustion after an operation.

by T. J. Reilly

The Soviet diesel submarine commander had spent the daylight hours beneath the surface of the Mediterranean Sea to avoid detection. To continue his mission of observing NATO shipping in his area, he orders the craft to surface in the cool, dark Med night. Stale air in the 290-foot sub needs to be removed and badly weakened batteries need a recharge.

In summer, the sun sets late in the Mediterranean and it's almost 11 p.m. before the commander feels safe in surfacing. His radar and sonar operators have reported that all is quiet in his operating area. But after less than thirty minutes on the surface, radar and lookouts all scream the same warning, "aircraft at 500-foot altitude and approaching fast." Within seconds the darkness of the night is broken by the blinding glare of a powerful searchlight and the next morning a U.S. Navy intelligence officer looks at a photograph showing the commander on the bridge of his submarine, shielding his eyes from the bright searchlight. An "eagle" had found its prey.

Like the American eagle, which it has adopted for its squadron emblem, the P3C "Orion" turbopropped anit-submarine warfare aircraft of Patrol Squadron Sixteen (VP-16) has the ability to "soar" or remain over a patrol area for long periods of time. They are also able to detect a "prey" or target from high altitudes and can quickly swoop down to "capture" or identify it, whether on the surface of submerged.

Continued on pg. 14

EDITOR'S NOTE: HSNS journalists Captain Mike Ryan, U.S. Army and Senior Chief Terry Reilly, U.S. Navy, were assigned the task of producing a feature on the naval aviation anti-submarine warfare community — personnel, skills, mission. Months of coordination resulted in permission being granted to accompany one of the Navy's 24 patrol squadrons on

Shown above is a P3C cabin crew (left to right) copilot, flight engine
(Photo by PH3 Mike Kleber) Below, Commander Silverman (secon
greets a crew returning from a mission.

the "Eagles"

its deployment to Sicily. For two weeks, the writers traveled, lived and worked with the "Eagles." The product was this two-part feature. HSNS is deeply indebted to Commander Richard A. Silverman, his officers and men, for their cooperation, assistance and enthusiasm regarding the gathering of these stories.

CPT Ryan (right) receives mission pointers from the copilot and below catches up on his sleep somewhere over the Med.

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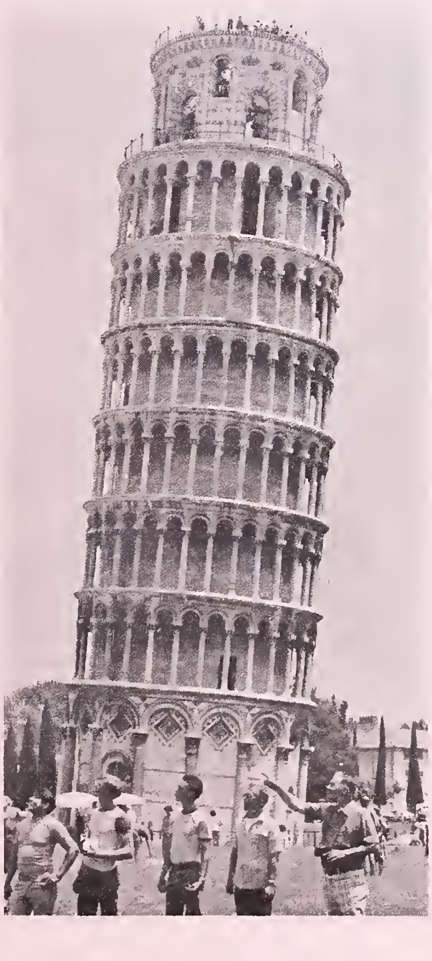
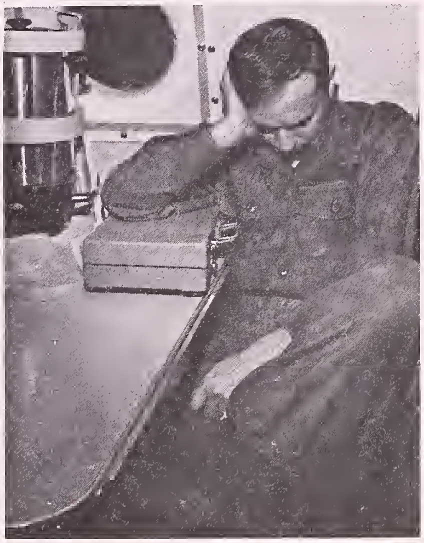
m right)

Crewmen enjoy sights of Pisa, Italy during off-duty time.





by D. M. Ryan

The aircraft's engines began to rev up and props cut through the heavy night air. Inside, the pilot's voice resounded over the intercom, "CONDITION FIVE!" Flight suit clad crewmen scrambled to their stations, put on helmets, survival vests and seat belts. They were prepared for takeoff.

Meanwhile, a lone figure, not part of the crew, positioned himself on a slender, bench-like seat in a small compartment of the plane. He wore only his uniform and a Mae West. For protection he carried a camera, notebook and rosary beads. While crackling radio messages filled the air, engines droned and lights flashed, this individual buckled himself in and anxiously eyed the crewmen.

The aircraft was a Navy anti-submarine warfare P3C "Orion", and its crew were members of Patrol Squadron Sixteen (VP-16), about to depart for a six-month deployment to the Mediterranean. The non-crew member was me, a volunteer, making the trip

Continued on pg. 17

Continued from pg. 12

The locating and identifying of submarines and surface ships, be it night or day, good weather or bad, is performed by a professional team. Whereas the feathered eagle has only natural instincts to help him hunt, each "Eagle" of Squadron Sixteen has a dozen or more highly trained young experts and thousands of pounds of twentieth century electronic aids to assist on its ocean prowl.

The P3C aircraft and its crewmen are the descendants of anti-submarine warfare developments which began in WW I. Originally, ship-towed balloons carried observers, looking for enemy subs. In WW II, the Navy developed long range flying boats augmented by land based Army aircraft to combat submarine threats. By war's end, radar, sonar and shore based patrol planes were in use. With the help of modern scientific techniques and equipment, the sophisticated electronic "Orion" aircraft was designed for use in today's complex military world.

In today's patrol plane, designed and built by some of the same companies that supplied equipment for putting men on the moon, flying Navy-men have been given space age titles like sensor station operator, flight tech and TACCO. There still are the old fashioned lookouts, but now they merely supplement the electronic scopes and digital readout indicators which can report the presence of a submarine at a far greater distance than the human eye can see.

The average Navy patrol squadron has nine aircraft and 11 crews, thus enabling the unit to fly it's patrols, have crew rest periods and devote time to squadron administrative functions and training.

Each twelve-man crew wears a similar style and color baseball cap to distinguish them apart. In civilian clothing the twelve could easily pass for a professional baseball team. They are incredibly young, the old man of the crew often being under 30, and like a major league team, all are in excellent health and physical condition. This is important since stamina is necessary to endure the long flights.

The manager of the flying Navy team is called the PPC for Patrol Plane Commander. A seasoned pilot, he has earned his position by completing flight training at Pensacola, FL, P3C introductory training with a special training squadron, and several tours of duty with various squadrons, first as a No. 3 (relief) pilot. After accumulating sufficient flying time and ground training, he was advanced to 2nd or co-pilot. Finally he was required to pass a rugged test on all aspects of the aircraft and aviation in general before being designated a patrol plane commander.

The strange term TACCO is derived from the title tactical coordinator. This Naval Flight Officer has received technical training at Pensacola and specialized P3C instruction before joining a squadron. On an operation, he is fed data from the computer and detection equipment which enables him to determine what ships and aircraft are in the area, whether they are identified or whether more investigation is needed. After analyzing the situation, he makes suggestions to the PPC. In sub hunting, he calls the action shots and is like a team coach.

Prior to assignment as a TACCO, the individual served as a navigator/communicator in the squadron. Using special navigational equipment, radios, teletype machines and data links, he helped guide the aircraft's flight, spoke with ground and ship contacts and forwarded information to these people. He also monitored weather conditions and kept the PPC advised. After a year of experience, he was ready to step across the aircraft aisle and become a TACCO.

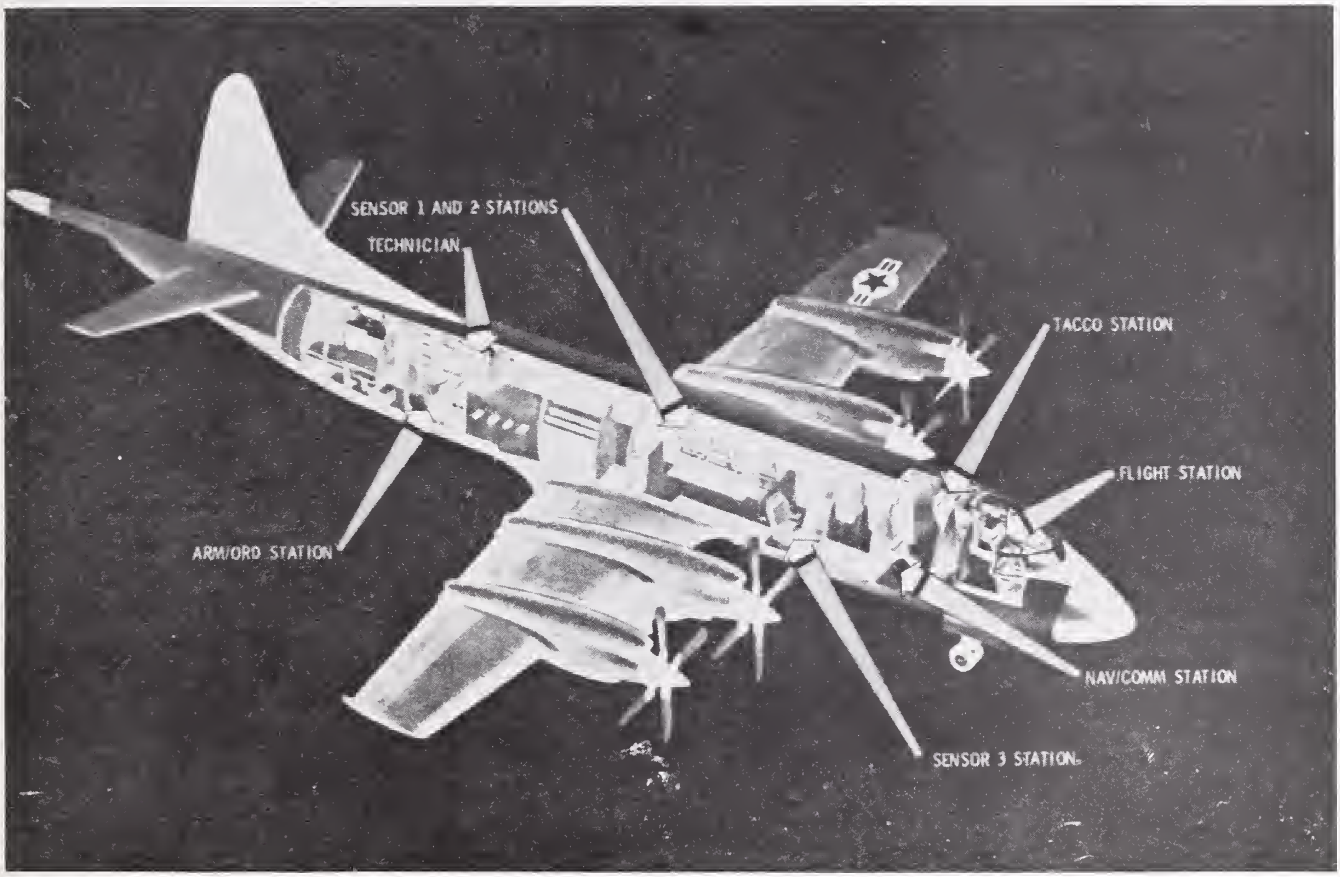
Seven members that make up the remainder of the crew are enlisted men. They started their careers at Navy boot camp, and by scoring high on the educational test were considered for aviation duty. After passing a flight physical and volunteering for the duty, they were sent to either a fundamentals school or directly to a technical school to qualify for their speciality. All had to display good learning ability and have a high aptitude for math and/or mechanics depending on their speciality.

The flight engineer sits between the pilot and co-pilot in the cockpit and performs as an aerial Casey Jones. Hours before takeoff, he can be seen checking the aircraft. Not a single inch of the plane is overlooked. With flashlight in hand, he even pokes his head into the jet intakes of the engines, looking for hiding birds. This specialist insures that proper amounts of fuel are loaded for the mission and advises the pilot on necessary speed and runway distance needed for takeoff. During the operation, the flight engineer monitors all power systems and keep his hands on the engine's throttles — like a flying Casey Jones.

The position of flight engineer can be held by a senior petty officer in the career fields of machinist's mate, electrician's mate or structural mechanic. Junior enlisted people in these skills are assigned to P3 crews as 2nd flight or relief engineers.

The heart of the P3C system is a computer. Assigned to keep it and all other modern electronic equipment operating is the flight technician. A member of the

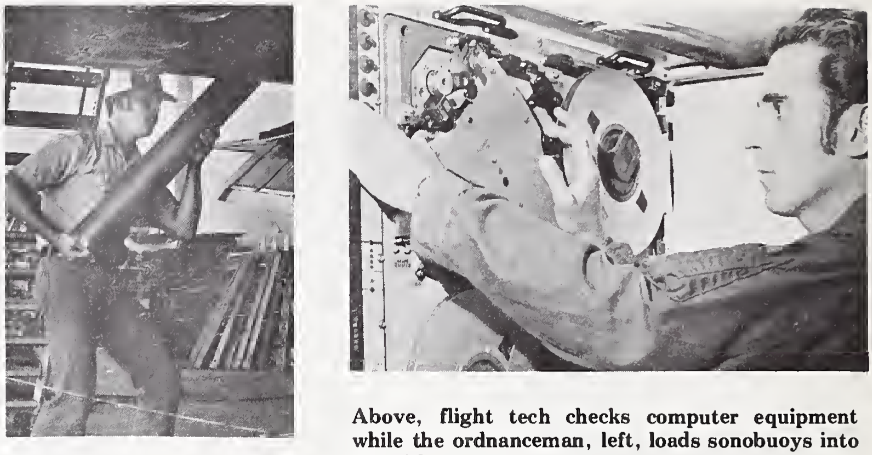
Continued on pg. 16



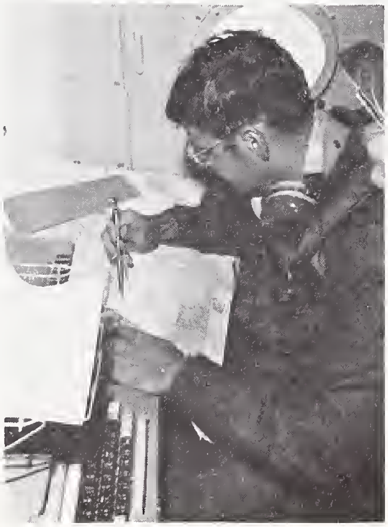
P3 Crew Stations

TACCO monitors positions of ships in the patrol area.

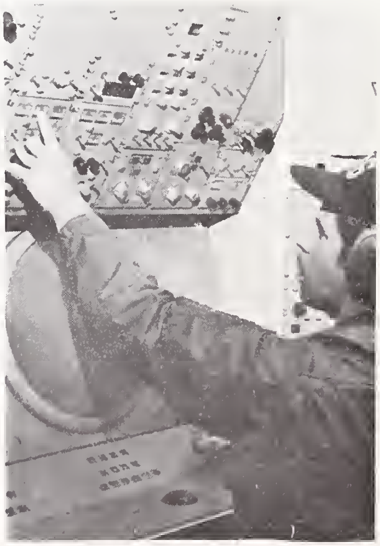
Sensor operators watch and listen for signals from sonobuoys which will indicate the presence of submarines.



Above, flight tech checks computer equipment while the ordnanceman, left, loads sonobuoys into his P3C.



Navigator checks the aircraft's position, above, and the station #3 operator, below, monitors a surface ship contact.



aviation electronics technician career field, this "doctor" is armed with two attaché cases full of tools and spare parts in order to perform in-flight repairs. With missions lasting up to eleven hours, airborne maintenance is vital to insure that the aircraft's sub hunting eyes remain bright and sharp.

The Star Ship Enterprise crew of recent TV fame would feel right at home in any of the three electronic sensor stations of the P3C. Not only can the young Aviation Anti-submarine Warfare Operators pierce the darkness and penetrate the very ocean itself in search of concealed submarines, but with the use of highly sophisticated acoustic and non-acoustic detection equipment they can also find, identify and track a deeply submerged, fast moving submarine.

The AWs, as the aviation anti-submarine warfare operators are known, are indispensible members of the aircraft crew. Their job is one of the primary purposes of the flight. Trained in the physics of sound and the properities of water, they must be expert in the use of airborne radar and even magnetic detection equipment. As crewman on the P3C, the three AWs each man a different sensor station. One will control the radar units while two operators man massive control consoles that monitor the readings from sonobuoys dropped from the bottom of the aircraft and which can pick up the noise generated by the machinery in the submarine.

As with other crew members, the AWs during the first 18 months in a squadron will have to pass extensive tests in all aspects of the fundamentals of flight, safety and survival, all leading to the awarding of the coveted aircrew wings. The Navy has placed the AW career field in a special category by awarding to those serving in it flight pay even when they may be serving in a non-flying assignment.

The last of the team is the Aviation Ordanceman who is also the part-time lookout and photographer. Normally occupying one of the seats next to a large bubble window in the tail area of the plane, he is responsible for reloading the sonobuoy tubes and for the care of any ammunition, bombs, torpedoes or mines that the patrol plane may carry. Always handy for a quick trip to the cockpit, the ordanceman and his large aerial camera are used to backup the camera in the nose of the aircraft.

Members of Patrol Squadron Sixteen are proud of the mission they perform and it reflects in their work. Satisfaction comes from the fact that they are not just training for a job which might have to be done in the future, but are daily performing actual missions. Their expertise and the quality of their equipment insure that the defense of the nation is active, not passive. It also increases the chance that wherever enemy submarines run submerged or start to surface, an "Eagle" will be waiting.

Continued from pg. 13

Unaccustomed as I was to Navy aviation, my curiosity was not unlike that of a kid in the dentist's office asking about everything — how it worked and why. One thing I had no questions about was the EMERGENCY PROCEDURES sign on the cabin wall. It explained what actions to take if we ditched in water or had to abandon the craft in flight. My mind echoed words from the crew chief's safety briefing, "...passengers into the life raft first...inflate the Mae West *after* exiting...strap the parachute on tight...jump when told...count three and pull the ring!" It quickly occurred to me that P3 operations were for real.

Deployment is defined as arrangement, placement or movement of troops strategically or appropriately. In the case of the VP-16 "Eagles," this meant go to the Mediterranean to hunt unfriendly submarines. Though based in Florida, the Squadron makes these six-month movements about every year to such places as Italy, Iceland, Bermuda, Spain and the Azores. At strategic locations like these the unit can best perform its mission of sub hunting. The importance of the job is realized in fact that if a conflict arose, the P3s could protect U.S. Navy ships and destroy enemy subs before they launched missiles.

Deployment means months of strenuous preparation to insure the orderly movement of millions of dollars worth of aircraft, maintenance support gear and equipment. It also means a period of concentrated operations, chances to travel, odd and often long hours and the opportunity to really use obtained skills. But most of all, deployment means family separation for many of the 80 officers and 290 men of a squadron.

An "Eagle" passes Mt. Etna, Sicily enroute to a Med patrol.

Flight engineer inspects his aircraft before deployment takeoff.

Final good-byes are made before the long flight to a six-month deployment base in the Med.

A birthday cake for the pilot helps make time go faster at 20,000 feet over the Atlantic.

Mechanic, above, insures that a P3C is ready for patrol. Below, relaxing atop the famous Tower of Pisa helps make the deployment more enjoyable.

As I paced about the runway taking pictures and waiting to join Crew #3 for the flight to the Med, the emotional scene of good-byes was hard to overlook. Wives, children, friends, fiances, relatives and even pets were plane-side to see the "Eagles" off. Only the long flight hours and busy schedule might help ease the feeling of separation. Needless to say, mail call was a popular part of any deployment day.

Once on site, everyone became business like, but maintained a sense of humor and the ability to relax and enjoy off-duty time. While the electronic world of anti-submarine warfare was fascinating and bewildering, it was the crewmen themselves that really impressed me the most. They were competent, highly skilled professionals who knew the value of teamwork. Their average age was young — officers 22-28 years; enlisted crewmen, 18-21. Whatever they lacked in experience, was made up for in enthusiasm and ability. Even under adverse conditions, they kept smiling and found a way to enjoy it all.

While maintenance crews worked shifts around the clock to keep the P3s flying, aircrews were either preparing for or performing a mission, on alert, training or getting some needed sleep. An operation lasted about fifteen hours with about eleven being actual flight time. Sub hunting was done at cold, toe-numbing altitudes of 15-20,000 feet and sometimes at hair raising heights of less than 1,000 feet about the water's surface. Weather conditions ranged from rainy or cool to sunny or moonlit. During an operation, crewmen caught sleep when they could, usually in one of two available bunks on the aircraft or on the floor. Quick meals — box lunches or TV dinners — were warmed and consumed in the galley along with gallons of coffee.

Deployments did not just include work. Recreation was important for both mental and physical well-being. Squadron members were able to take a vacation in the U.S. for up to two weeks and go on short trips to famous European cities. During off-duty time, many visited local towns to sample food and drink, meet new people and become acquainted with a different way of life. Some bought or rented cars. Still a few fortunate ones were able to bring their families to the deployment site for several months of living in the local community. Sports, movies, club activities and other forms of recreation were participated in to break the monotony of hard work away from home.

In the end however, the primary occupation of each day on deployment was sub hunting. A mission began hours before actual takeoff with briefings and preflight checks of the aircraft. For a night mission, this occurred between 9 and 12 p.m. Takeoff time was at "zero dark thirty" or around 12:30 a.m. The operations were conducted independently or in conjunction with a ground headquarters or a Navy ship at sea. No two were ever exactly the same.

As an observer on a mission, I had the opportunity to move about and watch the crewmen perform their specialties. Looking out the cockpit window as the water passed rapidly below, with moonlight reflecting off the sea, hearing the communications noise and seeing the console lights flashing, I felt like a World War II

Left, flight engineer monitors fuel levels while the pilot (background) concentrates on a Russian surface ship.

Above right, crewmen and the author (center) discuss the mission while a pilot gets some sleep.

Below right, it's good to touch solid ground after eleven hours over the Med.

crew member on a bombing run.

An hour or so into the operation, I was seated in the cockpit monitoring radio communications when the action began. The pilot and tactical coordinator estimated the situation and selected a spot to check for subs. Sonobuoys were dropped by computer and soon after entering the water began sending signals back to the aircraft.

"TACCO, sensor one. Contact on buoy three!" A sub was located.

Quickly, emotion and action reached a fever pitch as word of this spread. Computer data was fed to all aircraft stations. I saw only a blur of lights, mingled with sound. The crew saw a sub — and it wasn't ours. Proper authorities were notified and appropriate information gathered before flying off to another location.

"Flight, radar. Contact, bearing 090, twelve miles."

"Roger. Moving that way."

"Radar, flight. How far is the contact now?"

"Five miles."

"Roger. Keep me informed as to how close the nearest land mass is."

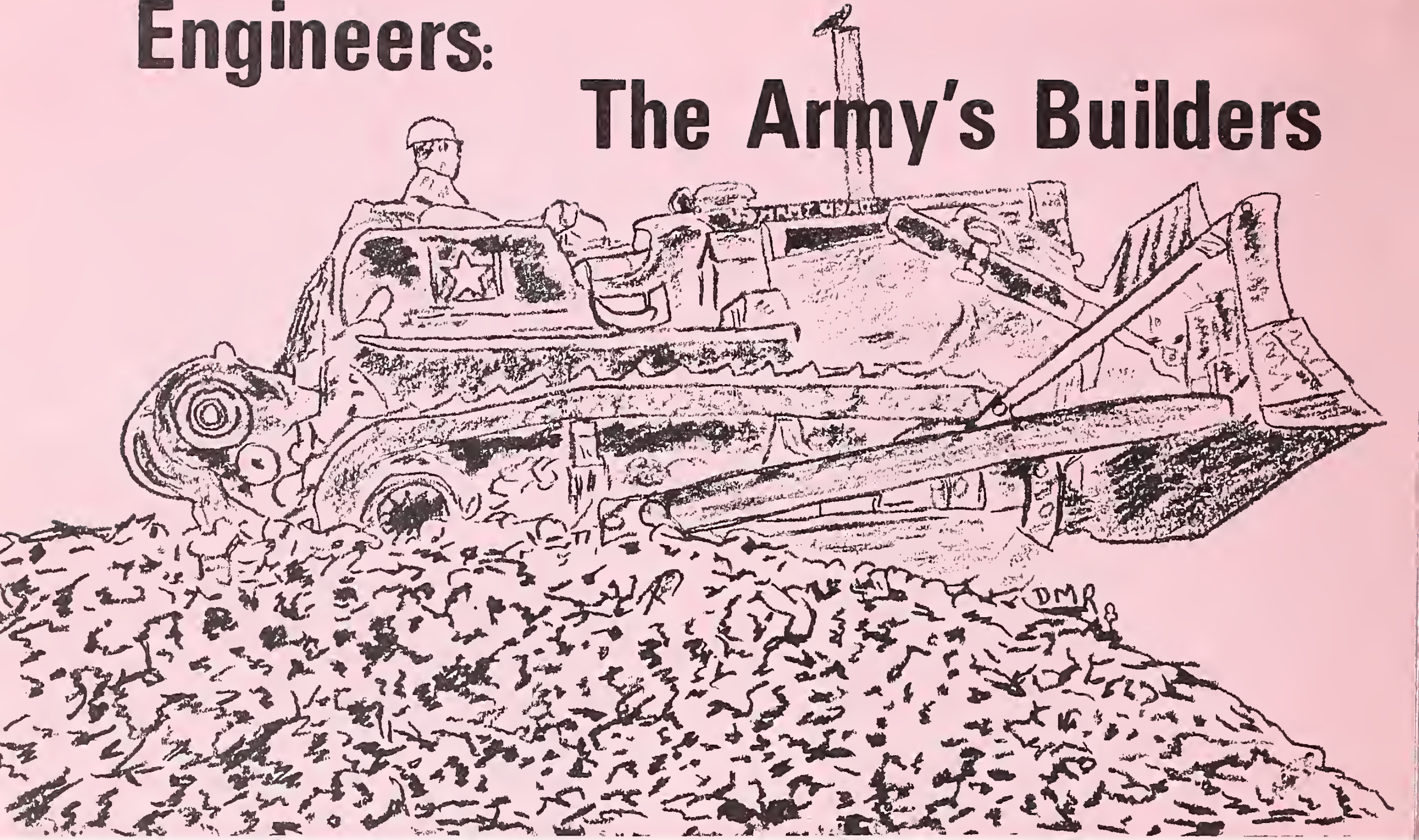
A surface contact was made, the radarman directed the pilot to the ship as well as made sure that air space or territorial waters of another country were not entered. As the aircraft altitude dropped, a spotter noted, "Contact off starboard." A right roll and a fly over revealed a Soviet cruiser. Pictures were taken, data recorded and the mission continued.

So it went into sunrise and on to landing time at 11:30 a.m. — eleven hours in the air. Touching ground felt good.

Observing and participating in the daily routine and operations of a P3 squadron on deployment was an eye-opening experience. Like most people, I wasn't aware that such units, equipment or missions existed. The professionalism, qualifications and dedication of Patrol Squadron Sixteen personnel was impressive. Even when the sophisticated gadgetry malfunctioned, the crewmen were able to perform their mission manually.

To an outsider like myself, experiencing a P3C Patrol Squadron deployment was an event not soon to be forgotten. To a unit member, it was just another day's work. One thought did linger though. It was comforting to know that the key defense mission of sub hunting was being performed by so capable an organization as Patrol Squadron Sixteen and units like it world-wide.

Engineers: The Army's Builders



by C. L. Nelson

Bite by bite, the hill was slowly breaking down, crunched into loose dirt and rocks by the relentless jabs of a back hoe. SP4 Mike Springfield squinted through mushrooming dust clouds as he concentrated on smoothly pacing the machine back and forth, clearing the way for the graders and pavement crew who would follow him.

Mike has spent hundreds of hours riding the cabs of the "big stuff" — scrapers, crawler tractors, dump trucks, hydraulic cranes. "I like being able to see results right away when I do something. That's what got me into running heavy equipment. I can look at a road that wasn't there last week and know that I was part of what put it there."

Assigned to a Ft. Hood, TX, engineer battalion, Mike gets his share of the post housekeeping chores — such jobs as fixing a road eroded from heavy rainfall or building an outdoor shelter for youth activities. But since early 1976, the members of his unit have also been spending increasing chunks of time out in the field areas, as part of the Army's renewed concern with combat readiness in engineering.

As a squad leader, Mike is now responsible not only for the mastery of his equipment, but also for seeing that his six-man team works together to get their assignment completed within specified time limits during the frequent practice exercises out in the "boonies" of Ft. Hood's brushy training areas. "We work better under a little pressure," he smiles. "The rest of the Army can't move across ravines or have supplies trucked in until we get in there first with bridges or roads, so we have to keep in practice. It gives us a chance to really test what we have learned on other jobs back on post."

The ballalion commander explains, "We have retained all of our capabilities for construction projects, but we are now taking training to perform these projects in a combat zone."

Supporting the combat troops — that's what combat engineering is all about. The science of tactics has always been a big part of military training, but within the engineer units which have converted to combat-ready status, it has gained enlarged respect. Practicing their trades in support of infantry units means that the engineers must come to understand the combat environment and be ready to perform such tasks as mine field rigging, demolition, camouflage and rapid bridge construction, in addition to the more routine domestic construction. Some 45 Army engineer units such as Mike's are now equally at ease under combat helmets or construction hardhats.

One-Stop Training

The road to combat readiness for many of these engineers began at Ft. Leonard Wood, MO. Under a recent training innovation, prospective combat and construction engineers can now make one stop to complete both Basic Combat Training (BCT) and their advanced individual skill specialty. Ft. Wood's Fourth Advanced Individual Training Brigade trains not only regular Army, National Guard and Army Reserve, but also Marines, Air Force, Canadian Army, ACTION and VISTA volunteers.

The "pioneer" combat engineering course, especially, concentrates on honing map reading, field fortification building and rifle squad tactics, introduced to students during BCT. Theirs will be the job of carving roads in heavy terrain, laying airstrips, setting explosives and erecting fixed and floating bridges in direct assistance to fighting units.

For others in engineering, the road may branch into carpentry as a construction worker, maintenance of pipes and water systems as a plumber or water supply technician, stringing electrical or communications wire as an electrician, rock crushing as a quarryman, or road building as an asphalt or concrete specialist, after completion of one or more of the 20 separate courses offered by the training brigade.

For construction engineer students who catch on quickly to Ft. Woods courses, there are extra training incentives. In 1973, the Army came up with a program to produce multiskilled, highly flexible engineers by allowing students to gain proficiency on the big construction equipment at a self-paced rate. Those who have previous experience from civilian jobs or who show promise in learning can finish the basic operator's course early and have time to add extra training on other pieces of equipment.

WET WORK — An engineer platoon in the Third Infantry, stationed in Germany, takes advantage of bivouac exercises to practice putting together aluminum foot bridges. The engineers are usually out ahead of the other participating units in order to prepare the exercise area. (U. S. Army Photo)

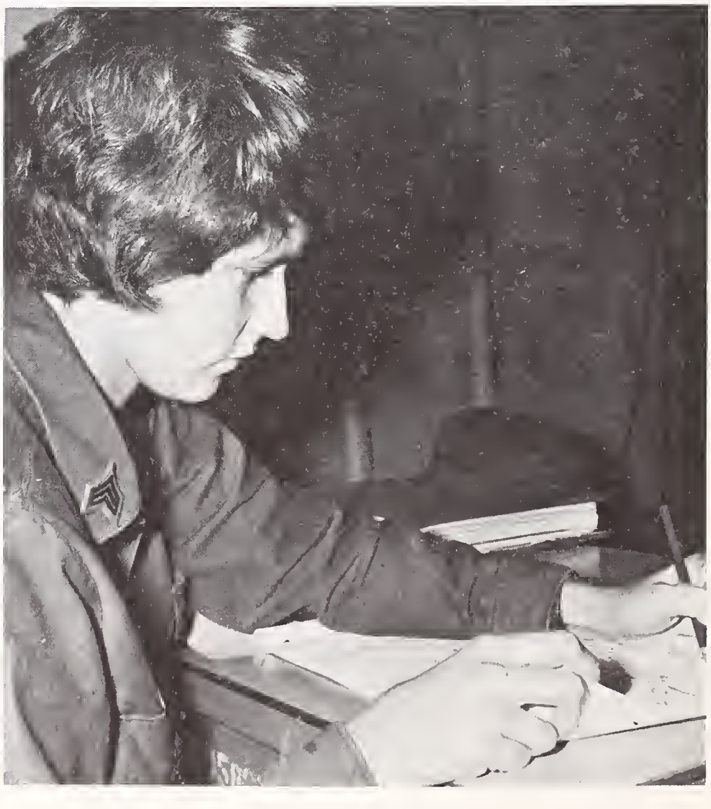
The seven-week Crawler Tractor Course, for example, can be condensed down to as little as three or four weeks if students can pass a standard performance test. They then go on to learn operation of scooploaders and wheeled tractors before graduation. Tests are offered at the three, four and five week points and each student makes the decision as to when he or she feels ready to demonstrate the required skills.

According to Engineer School instructors, the program has been very popular among the students. As many as 53 per cent of each cycle's graduates have gone on to their first permanent assignments knowing how to operate two pieces of equipment, while 10 per cent more are proficient on three pieces. Those trainees who still need the full seven weeks to learn the crawler tractor have not become discouraged since so many of their classmates now have the time to help each other out.

Fixing things up

A buzz of recognition goes through the cluster of students as they watch an instructor remove a generator casing to reveal parts they have just seen diagrammed in the classroom. The instructor reviews components to be removed, cleaned, checked for wear and replaced. The group then breaks into teams of twos and threes, anxious to begin the hands-on experience of trying the operation for themselves.

Repair and maintenance of engineering equipment is taught at the original "Home of Army Engineers," Ft. Belvoir, VA. There, inside a line of large buildings packed with everything from refrigeration and hydraulic brake systems to missile guidance electronics and sensitive infra-red optical devices, enlisted and officer students take vocational and professional courses ranging from five to twelve weeks.



ABOVE: A Special Forces engineer sweeps a river bank with an electronic mine detector, looking for mines and unexploded shells. (U. S. Army Photo)

TOP LEFT: Construction engineer students rig up a pile driver in preparation for sinking bridge supports. (U. S. Army Photo)

BOTTOM LEFT: Following a schematic drawing, a Ft. Belvoir, VA soldier "troubleshoots" a 1.5 kilowatt tactical electrical generator, as part of the eight-week Mobile Electrical Power Generator Repair course. (U. S. Army Photo)

The school strives constantly to keep up with increasing demands for skilled repair technicians. More than 9,000 students annually are graduated from courses covering basic military repair occupations through graduate level engineering and management.

The instructor comments, "We have a very low drop-out rate among our classes because we teach things in logical steps. First come classes in safety and shop operations, but we don't overload the students with mechanical or electrical theory without giving them a chance to take the equipment apart. It's as practical as we know how to make it. Once the student learns the basic systems here, he or she can go to an assignment and work on just about any piece of engineer equipment. Whether they have had previous experience or not, we give them a good foundation. And since the Army is buying more and more construction equipment directly from civilian manufacturers, our students could use their training to qualify for a repair job after their military service is finished."

The Army's women engineers are equally at home sitting atop construction equipment, working in machine shops or dismantling mechanical systems, however, they are not assigned to those engineer units involved in combat readiness training.

PFC Karen Woodbridge entered the engineering field because, "I wanted to work outdoors." She goes on to add, "After I'd spent some time learning to run the equipment, I found that what I really enjoyed was taking it part to see what causes breakdowns." After a year and a half of working in a construction unit at Ft. Carson, CO, Karen joined an electronics class at Ft. Belvoir to cross-train on the repair of night vision equipment. She returned to her home post with a new skill needed by her unit during night training exercises. She sums up, "For me, engineering means getting things done."

That sentiment is echoed by men and women employed in construction, maintenance and combat engineering jobs around the world. Pathfinders, builders, protectors — the Army Corps of Engineers has helped the United States to grow, while pushing out the limits or its own capabilities in adding new skills and modern equipment. From its first tasks in supplying fortifications at Bunker Hill to reconnaissance support in Southeast Asia, the Corps has followed its motto, "Essayons," — "Let Us Try."

Not only do Army engineers try, they accomplish.

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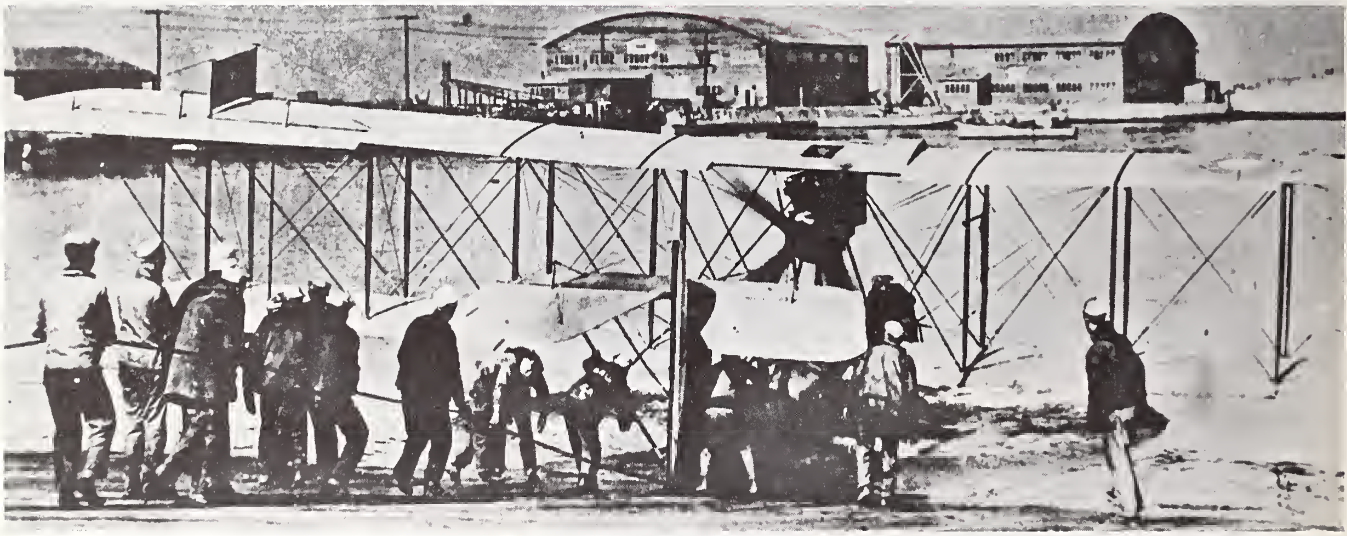

Sub Hunting

Above and below, an early Navy WW I anti-submarine patrol plane and its crew are prepared for takeoff on an operation. (U. S. Navy Historical Photo)

It was just 65 years ago that the Navy began "... testing gasoline motors and other experimental work in development of aviation..." The use of naval aircraft in anti-submarine operations has come a long way since those pioneer days of 1911. It was in that year that the Navy accepted its first airplane into service.

Soon after, World War I started, during which the Central Powers made fine use of aircraft and submarines. In the U.S., it had been recognized that the plane would be a vital weapon. But when the Americans entered the conflict, naval aviation consisted of one air station, 54 aircraft and 287 personnel.

Despite its size, the Navy's "air force" proved valuable in surface anti-submarine operations. Aircraft sank or damaged 12 of the 25 enemy subs engaged, while their presence helped neutralize the sub threat. As a result, experts were convinced that patrol plane development was a future necessity.

During World War II, the mission of anti-submarine warfare was critical to the success of Allied efforts. The Navy employed some 125 dirigibles plus other assorted aircraft in support of such operations. The best known of the patrol planes was the PBY-5 "Catalina" which was most effective, especially in the Pacific.

While 65 years is a relatively short time, rapid and dramatic changes have been made in the areas of submarine hunting and patrol aircraft.

Development of anti-submarine patrol aircraft continued as new methods and equipment were designed. The end result was today's P3C "Orion" craft. Its story can be found inside this issue of PROFILE.